L 26702-66

ACC NR: AT5028448

solving the first group of problems. In the second group, the first derivatives are computed from nondifference formulas of numerical differentiation obtained from a Lagrange interpolation formula. Feedbacks are simulated either by iteration cycles or by a transformation of the system transfer function. The accuracy of calculations is discussed, and techniques for its improvement (such as alternating the differentiation and integration operations) are suggested. Orig. art. has: 5 figures and 8 formulas.

SUB CODE: 09, 12 / SUBM DATE: none / ORIG REF: 003

Card 2/2 MOS

L 40723-66   EWT(m)/EWP(t)/ETI   IJP(c)   JD/JD/JW
                                    SOURCE CODE: UR/0420/65/000/004/0098/0103
ACC NR: AP6018609

AUTHOR: Karlashov, A. V.; Gnatyuk, A. D.; Tokarev, V. P.

ORG: Kiev Institute of Civil Aviation Engineers (Kiyevskiy institut inzhenerov grazh-danskoy aviatsii)

TITLE: Corrosion endurance of D16ATV sheet duralumin

SOURCE: Samoletostroyeniye i tekhnika vozdushnogo flota, no. 4, 1965, 98-103

TOPIC TAGS: sheet metal, fatigue strength, sea water corrosion, aluminum alloy/ D16ATV aluminum alloy

ABSTRACT: Data are given from experimental studies of the corrosion resistance of D16ATV duralumin alloy which is widely used in aircraft construction. The corrosion media were fresh water and a 3% NaCl solution simulating sea water. The tests were done on a machine with a loading frequency of 200 cycles per minute on a test base of $5 \cdot 10^6$ cycles. The specimens were tested for fatigue under pure bending conditions to a given deformation. The specimens were made from 2.0 mm sheet duralumin. The chemi-cal composition of the material is as follows (in %): 4.2 Cu, 1.6 Mg, 0.5 Mn, 0.3 Fe, 0.2 Si and 0.5 Zn. Analysis of the experimental results shows that the effect of the corrosive media depends on aggressiveness and the number of test cycles. The maximum reduction in the fatigue limit on a test base of $5 \cdot 10^6$ cycles was 15 and 42.5% in H_2O

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L 40793-66

ACC NR: AP6018609

and a 3% solution of NaCl respectively. The corresponding values for a test base of $2 \cdot 10^5$ cycles were 7 and 20% respectively. This increase in the effect of the medium on the fatigue limit of the alloy with an increase in the number of test cycles takes place in the range of maximum amplitude stresses. There is no further increase in this effect when these stresses are reduced. Agressive media have a greater effect on the durability of the material than on its fatigue strength. A probabilistic evaluation of the fatigue limits for aluminum alloys gives a more exact figure for the effect of corrosive media on the fatigue strength of the material for establishing the service life of structural elements subjected to the action of these media. Orig. art. has: 3 figures, 2 tables.

SUB CODE: 11, 20/ SUBM DATE: none/ ORIG REF: 006

Card 2/2 mLP

KARLASHOV, A.V.; GNATYUK, A.D.; TOKAREV, V.P.

Effect of corrosive and surface-active media on the resistance of aluminum alloys. Fiz.-khim. mekh. mat. 1 no.1:??-?? '65.
(MIRA 19:1)

1. Kiyevskiy institut grazhdanskoy aviatsii. Submitted August 12, 1964.

KARLASHOV, A.V.; GNATYUK, A.D.; TOKAREV, V.P.

Fatigue strength and durability of aluminum alloys in corrosive media. Fiz.-khim. mekh. mat. 1 no.5:542-547 '65.
(MA 19:1)

1. Kiyevskiy institut inzhenerov grazhdanskoy aviatsii. Submitted Feb. 27, 1965.

KAPLASHOV, A.V.; TOKAREV, V.F.

Effect of the frequency of loading on the fatigue and corrosion-fatigue strength of the B95 alloy with a stress concentrator.
Fiz.-khim. mekh. mat. 1 no.5:548-551 '65. (MIRA 19:1)

1. Kiyevskiy institut inzhenerov grazhdanskoy aviatsii. Submitted June 5, 1965.

TOKAREV V.

APTEKAREVA, Ye.I., SHMELEV, N.S., TOKAREV, V.T.

Nikolai Grigor'evich Dam'e; on his 60th birthday.   Ortop.travm
i protez 19 no.2:84 Mr-Ap '58   (MIRA 11:5)
        (DAM'E, NIKOLAI GRIGOR'EVICH, 1897-)

GRODZOVSKIY, G.L. (Moskva); DYUKALOV, A.N. (Moskva); TOKAREV, V.V. (Moskva);
TOLSTYKH, A.I. (Moskva)

Self-simulating gas motions with shock waves propagating with a
constant speed in a motionless gas. Prikl. mat. i mekh. 23 no.1:
198-200 Ja-F '59.

(Aerodynamics, Supersonic)   (MIRA 12:2)

TOKAREV, V.V.   and TOLSTYKH, A.I., GROZDOVSKIY, G.L., DYUKALOV, A.N.,

"Electrical Current in an Axismmetric Meridian Flow Field of a Conducting
Fluid; smoothing of parameters in viscous helical flows."

Report presented at the First All-Union Congress on Theoretical and Applied
Mechanics, Moscow, 27 Jan - 3 Feb 1960.

69295

10.2000A

S/179/60/000/01/006/034
E031/E535

AUTHORS: Grodzovskiy, G.L., Dyukalov, A.N., Tokarev, V.V. and
          Tolstykh, A.I. (Moscow)

TITLE: The Axisymmetric Meridianal Flow of a Conducting Fluid.
          Equalization of the Parameters of the Rotational Flow
          of a Viscous Fluid

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh
          nauk, Mekhanika i mashinostroyeniye, 1960, Nr 1,
          pp 41-46 (USSR)

ABSTRACT: The electrodynamic equations of magnetohydrodynamics and
          the equation for the current density j are simplified by
          the assumption that the velocity and current density
          components v_θ and j_θ are zero, (a cylindrical
          coordinate system, r, θ, x is used). For meridianal flow
          of an incompressible conducting fluid at constant velocity
          $v_x = v_o$, $H_r = H_o$, and a further simplification can be made.
          A solution for H_θ is sought in separable form as $X(x)R(r)$.
          To this solution a linear term in the radius is added to
          satisfy the equations of motion. Boundary conditions are
          derived by assuming that the cylinder which bounds the
          fluid is non-conducting. Similarly to the known exact
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S/179/60/000/01/006/034
E031/E535

The Axisymmetric Meridianal Flow of a Conducting Fluid. Equalization
of the Parameters of the Rotational Flow of a Viscous Fluid

solution of the flow of a viscous incompressible fluid
it is shown that in the case of the meridianal flow of
an incompressible conducting fluid the equations of
magnetohydrodynamics permit of a class of "automodel"
solutions (dimensional analysis is invoked). The
velocity and field components and the pressure are
expressed in terms of the non-dimensional parameter
$\zeta = x/r$ and the functions of this parameter which occur
are determined by the solution of four ordinary differen-
tial equations. These equations are solved by introducing
a function related to the stream function. The direction
of the current along rays passing through the origin is a
characteristic of the flows under discussion. Two
examples are discussed. One is a conical charge in an
unbounded medium. The other is a charge in a conical
channel with non-conducting walls. Finally the similarity
of the above problem with that of the axisymmetric flow of
Card 2/3   a viscous fluid moving with constant velocity inside a

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S/179/60/000/01/006/034
E031/E535

The Axisymmetric Meridianal Flow of a Conducting Fluid. Equalization
of the Parameters of the Rotational Flow of a Viscous Fluid

cylinder in the absence of friction at the walls is
discussed.
There are 3 figures and 6 Soviet references.

SUBMITTED: April 14, 1959

Card 3/3

TOKAREV, V.V.; TOLSTOFYATOV, K.S.; OKUNEV, L.R.

Voltage regulator for supplying measuring circuits of electronic potentiometers. Sbor.rats.predl.vnedr.v proizv. no.1:37-38 '61.

(MIRA 14:7)

1. Zavod "Elektrostal'."

(Voltage regulators)

TOKAREV, V. V

a.

b.

Tyuralna, L. O.

c.

d. G. N. GROZDOVSKIY,

e.

f.

g.

h.

i.

reports to be presented at the XIIth International Astronautical Congress,
Washington D. C. 1-7 October 1961

(19)

3.9200 (1069, 1080, 1132)

AUTHORS: Grodzovskiy, G. L., Ivanov, Yu. N., and Tokarev, V. V.

TITLE: Motion of a body with variable mass and constant power
                consumption in a gravitational field

TEXT: The present paper gives a study of the general case of the
optimization of the reactive motion of a body with variable mass in a
gravitational field of two centers when the power consumption is constant.
For a given trajectory, the acceleration is equal to $a(t) = -V dm/m dt$, where
V is the escape velocity. The utilizable reactive power may be written
as $N = -dmV^2/2dt$. Thus, $a^2/2N = -dm/m^2 dt$. This gives by integration the

weight of the body as a function of time: $G = G_0 \left(1 + \int_0^T \frac{G_0}{2Ng} a^2 dt \right)$. The

specific weight of the power source is defined as: $\alpha = G_N/N$, and the

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Motion of a body with variable ...

relative total weight initially is given by $\overline{G} = (G_M + G_N)/G_o$

$= \alpha \left| N/G_o + 1 - 1 - 1 \right| \left(1 + \int_0^T \frac{G_o}{2N g} a^2 dt\right)$. For a given a(t) the quantity $\overline{G}$

has a minimum: $\overline{G}_{min} = 2\sqrt{\dot{\phi}} - \phi$ at $(G_N/G_o)_{opt} = (\alpha N/G_o)_{opt} = \sqrt{\dot{\phi}} - \dot{\phi}$,

where $\dot{\phi} = \frac{\alpha}{2g} \int_0^T a^2 dt$. In the case of a step by step decrease of power

related to a decrease in weight, the maximum relative utilizable weight
may be calculated from the formula

$$\overline{G}_{\text{п. макс}} = (1 + \Phi_1 - 2\sqrt{\Phi_1}) \prod_{i=2}^{n} \left(\frac{1 - \Phi_i}{1 + \Phi_i}\right)^2. \qquad (4),$$

(4).

Here, $\sum \phi_i = \phi$ is given. The optimum ratio between the ϕ_i may be

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Motion of a body with variable ...

obtained from (4) by differentiation. Fig. 1 graphically shows $\overline{G}_{min}$ and G_M/G_O as functions of ϕ. As is seen from this graph, a minimum of $\overline{G}$ requires a minimum of the integral $\int_0^T a^2 dt$. As an illustration, the

motion in a plane spiral is studied in the case of small accelerations.

The result obtained is: $r/R_0 = 1/\left(1 - \int_0^t k(t)dt / \frac{R_0}{v_0}\right)^2$. The next topic

studied is the optimum displacement of a body of variable mass in the time T between two given points. This problem leads to a variation problem for

the integral $I = \int_0^T a^2(t)dt$. Here, the plane motion in the gravitational

field of two centers is investigated, one of which is at rest and the other

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21368

Motion of a body with variable ...

moves with constant angular velocity ω on a circle of radius r_0 about
this center. In order to study the motion of the body in a region in
which one of the two centers has a dominating effect on the motion of the
body, it is convenient to place the reference system in this center.
On these assumptions, the integral of the variation problem introduced
above yields the integral

$$I = \int_0^T \left\{ \left[\ddot{r}_i - r_i(\dot{\psi}_i + \omega)^2 + \frac{k_i}{r_i^2} - \Re_i \right]^2 + \left[r_i \ddot{\psi}_i + 2\dot{r}_i (\dot{\psi}_i + \omega)\ \Psi_i \right]^2 \right\} dt. \qquad (9)$$

Euler's equations of this variation problem are:

$$\dot{a}_{r_i} = \frac{1}{v_{r_i}} \left[\frac{a_{r_i}^2 + a_{\psi_i}^2}{2} + a_{r_i}\left(\frac{v_{\psi_i}^2}{r_i} - \frac{k_i}{r_i^2} \right) - \lambda_i - v_i \frac{v_{\psi_i}}{r_i} \right], \qquad (10)$$

$$\dot{a}_{\psi_i} = \frac{1}{r_i}\left(a_{\psi_i} v_{r_i} - 2a_{r_i} v_{\psi_i} + v_i \right); \qquad (11)$$

$$\dot{v}_i = a_{\psi_i}\Psi'_{i\psi_i} + a_{r_i}\Re'_i\psi_i; \qquad (12)$$

$$\dot{\lambda}_i = - v_{r_i}\left(a_{\psi_i}\Psi'_{ir_i} + a_{r_i}\Re'_{ir_i} + \frac{\Psi_i}{r_i} a_{\psi_i} \right) - v_i \frac{\Psi_i}{r_i} - \dot{a}_{r_i}\Re_i - \frac{v_{\psi_i}}{r_i}(v_i - 2a_{r_i}\Psi_i);$$

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$$v_{r_i} = \dot{r_i}, \quad v_{\psi_i} = r_i(\dot{\psi_i} + \omega). \tag{14}$$

The problem is simplified and limited to the following variation problem: It is desired to find a trajectory which gives a minimum for

$\int_{r_1}^{r_2} a^2 dr/v_r$ under the additional isoperimetric condition. The time for

the displacement from r_1 to r_2 $\left(T = \int_{r_1}^{r_2} dr/v_r \right)$ and the polar angle of

the displacement $\Delta\psi = \int_{r_1}^{r_2} v_\psi dr/rdr$ are given. With their help, expressions

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Motion of a body with variable ...

can be found for $\dot{a}_r$ and $\dot{a}$ which agree with (10) and (11) for $\varkappa = 2\lambda$, and $\varkappa_2 = 2\nu$. It is shown that in the case of the free fall along the optimum trajectory the acceleration varies linearly with time. Finally, the singularities of the system are also studied. There are 2 figures and 2 references: 1 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: J. H. Irving, E. K. Blum, Vistas in Astronautics, 2, Second Annual Astronautics Symposium, 1959.

ASSOCIATION: Tsentral'nyy aero-gidrodinamicheskiy institut im. N. Ye. Zhukovskogo (Central Institute of Aero- and Hydrodynamics imeni N. Ye. Zhukovskiy)

PRESENTED: August 1, 1960, by L. I. Sedov, Academician

SUBMITTED: July 24, 1960

Card 6/7

POTAPOVA, T.A.; TOKAREV, V.V.

Determination of metal content in an alumimum cell with
the help of the isotope Au^{198}. TSvet. met. 35 no.7:51-54
Jl '62.
(MIRA 15:11)
(Aluminum—Electrometallurgy)
(Radioisotopes—Industrial applications)

GRODZOVSKIY, .G. L. , IVANOV, Yu. N. and TOKAREV, V. V.

(1)

"On the Motion of a Body of Variable Mass with Constant and Decreasing Power Consumption in a Gravitational Field.:"

Report presented at the 13th Intl. Astronautics Congress, Varna, Bulgaria, 23-27 Sep 62.

L 17077-63   ES(w)-2/EPR/EPA(b)/EWT(1)/FS(t)/EWT(m)/EWG(k) EPC(w) PC(v)-2/BDS/ES(v)
AEDC/AFFTC/ASD/AFMDC/PSL-3 APGC AFWL/UCP 3 SSD   Pa-4/Pd-4/Pz-4/Pe-4/Pab-4/
Po-4/Pg-4/Pq-4   WW/GW
ACCESSION NR: AP3006364   S/0258/63/003/003/0590/0615
                                                              108

AUTHOR: Grodzovskiy, G. L. (Moscow); Ivanov, Yu. N. (Moscow);
Tokarev, V. V. (Moscow)

TITLE: The mechanics of space flight with low thrust. I.

SOURCE: Inzhenerny*y zhurnal, v. 3, no. 3, 1963, 590-615

TOPIC TAGS: space flight, solar sail, low thrust, rocket thrust,
space ship, space flight mechanics, low thrust rocket, low thrust
vehicle

ABSTRACT: This article is the first in a series of review articles
dealing with the mechanics of space flight at low thrust. On the
basis of Soviet and non-Soviet sources the article reviews these
principal subject areas: 1) the mechanics of space flight with a
solar-sail space vessel, including fundamental relationships and
problems and the flight of such a vessel between planetary orbits
and its escape from a gravitational field; and 2) the mechanics of
space flight with low-thrust engines, including the selection of
optimum weight ratios for simpler cases of motion and an ideal

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L 17077-63
ACCESSION NR: AP3006364

control system with optimum weight and thrust control. The follow-
ing recent works are noted among the 20 Soviet sources reviewed:
V. K. Isayev, "The principle of L. S. Pontryagin's maximum and the
optimum programing of rocket thrust," Avtomatika i telemekhanika,
v. 22, no. 8, 1961, and v. 23, no. 1, 1962; A. N. Zhukov and V. N.
Lebedev, "A variational problem in flight between heliocentric
circular orbits by means of a solar sail," Sb. Iskusstvenny*ye sput-
niki Zemli, 1963, in publication; A. A. Kary*mov, "Determination of
forces and moments of light pressure acting on a body moving in
space," Prikl. matem. i mekhan., v. 26, no. 5, 1962; G. L. Grodzov-
skiy, "Optimization of parameters of motion of a body with variable
mass and limited power consumption in the presence of a nonlinear
dependence between the power source weight and the power output,"
Izv. AN SSSR, Otd. tekh. N. 1963, in publication; and Yu. N. Ivanov,
"The motion of a body with variable mass, limited power output, and
given time of operation," Prikl. matem. i mekhan., v. 27, no. 5,
1963. Orig. art. has: 25 figures, and 70 formulas.

ASSOCIATION: none
SUBMITTED: 00   DATE ACQ: 27Sep63   ENCL: 00
SUB CODE: AS   NO REF SOV: 020   OTHER: 053
Card 2/2

TOKAREV, V. V., IVANOV, I. N., and GRODZOVSKIY, G. L.,

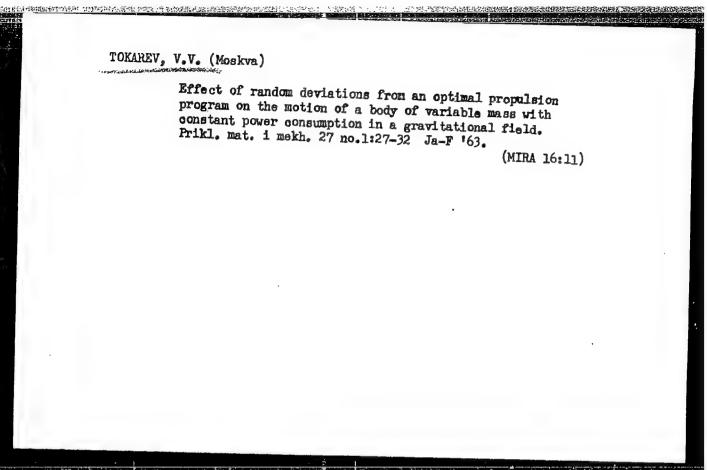"On the motion of a body of variable mass with constant and decreasing power consumption in a gravitational field; part III"

report to be submitted for the 14th Congress Intl. Astronautics Federation, Paris, France, 25 Sep-1 Oct 1963

GRODZOVSKIY, G.L. (Moskva); IVANOV, Yu.N. (Moskva); TOKAREV, V.V. (Moskva)

Mechanics of space flight with low thrust. Part 2. Inzh.zhur. 3
no.4:748-766 '63.
(MIRA 16:12)

TOKAREV, V.V. (Moskva)

Effect of random deviations from an optimal propulsion
program on the motion of a body of variable mass with
constant power consumption in a gravitational field.
Prikl. mat. i mekh. 27 no.1:27-32 Ja-F '63.

(MIRA 16:11)

ACCESSION NR: AP3004110

AUTHOR: Tokarev, V. V. (Moscow)

TITLE: Optimal control of power source for moving a body of variable mass with active breakdown of power source

SOURCE: Prikladnaya matematika i mekhanika, v. 27, no. 4, 1963, 629-640

TOPIC TAGS: optimal control, power source, variable mass body, power source break-down, reactive jet, fuel supply, fuel consumption, variational problem

ABSTRACT: Yu. N. Ivanov (Optimal'noye umen'sheniye moshchnosti pri dvizhenii tela peremennoy massy* v gravitatsionnom pole. PMM, 1962, t. XXVI, vy*p. 4) studied continuous and step-wise decrease of power. The author of the present work generalizes that problem to the case where thrown-off sections of the power source can be partially or completely used as fuel for the creation of thrust. The system of equations describing the motion of a variable mass body in a gravitational field and the weight change of the body are

$$\dot{G}_m = -q_m,$$
$$\dot{G}_N = -q_v,$$
$$\dot{\mathbf{r}} = \mathbf{v}, \quad \dot{\mathbf{v}} = \mathbf{i}\frac{\sqrt{(2g/a)\,G_N N\,(q_m + \tau q_v)}}{G_m + G_N + G_n} + \mathbf{R} \qquad (1)$$

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ACCESSION NR: AP3004110

The weight of the body G is assumed to be distributed among the fuel supply G_m, the power source G_N and the payload G_n, and G_m and G_N change with time t. The weight consumption per second $q_m(t) \geq 0$ and the γ-part $(0 \leq \gamma(t) \leq \gamma_{max} \leq 1)$ of the consumption $q_\gamma(t) \geq 0$ are used for creating reactive thrust. The weights G_m, G_N, G_n and consumptions q_m, q_γ are related to the initial weight of the body. The power of the reactive jet $N = qV^2/2$ (where V is discharge velocity) can vary from zero to some maximal value. The maximal amount of power is assumed to be linearly related to the weight of the power source $N_{max} = G_N/\alpha$ (α is the specific gravity of the power source). The power N is considered in reference to its maximal value, so that $0 \leq N(t) \leq 1$. The unit vector $i(t)$ indicates thrust direction. Moreover, r and v denote the radius-vector and the velocity of the body, $R + R(r,t)$ and g denote respectively acceleration from gravitational forces at a point and the amount of acceleration of the force of gravity on the earth's surface. The combination

$$\sqrt{(2g/a)G_N N(q_m + \gamma q_\gamma)}/(G_m + G_N + G_n) = a \qquad (2)$$

is acceleration from thrust (thrust on the moving mass). A dot denotes differentia-

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ACCESSION NR: AP3004110

tion with respect to time. The author poses the problem of finding the minimal time of motion T for a given value of payload G_n. This problem reduces to the following variational problem for system (1): to choose, from the set of piecewise-continuous, piecewise-smooth functions, controls

$$0 \leqslant N(t) \leqslant 1, \quad 0 \leqslant \gamma(t) \leqslant \gamma_{max}, \quad |i(t)| \equiv 1$$
$$0 \leqslant q_m(t) < \infty, \quad 0 \leqslant q_v(t) < \infty \qquad (3)$$

which guarantee, for given G_n, γ_{max} and α, the minimal time T for passage of system (1) from a given initial state

$$G_{mo} + G_{No} = 1 - G_n \qquad (t_0 = 0) \qquad (4)$$

to a given final state

$$G_{m1} = 0 \qquad (t_1 = T) \qquad (5)$$

under the conditions

$$G_m(t) > 0, \quad G_N(t) > 0 \qquad (6)$$

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ACCESSION NR: AP3004110

Orig. art. has: 10 figures and 47 formulas.

ASSOCIATION: none

SUBMITTED: 19Jan63   DATE ACQ: 15Aug63   ENCL: 00

SUB CODE: FL   NO REF SOV: 006   OTHER: 002

Card 4/4

TOKAREV, V.V. (Moscow) ...

"A variational problem of the motion of a variable mass body with random and optimum decrease in power"
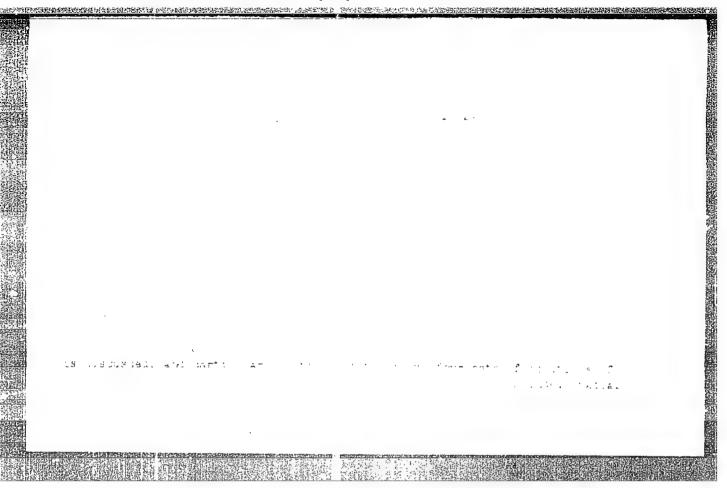
Report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow 29 Jan - 5 Feb 64.
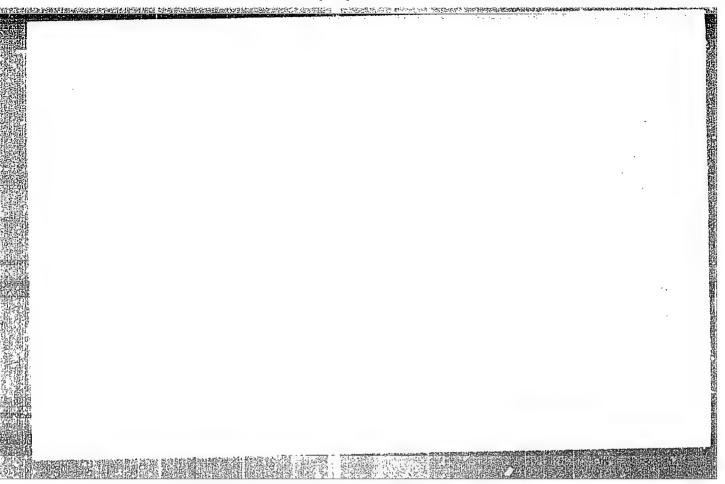
GRODZOVSKIY, G. L.; IVANOV, Yu. N.; TOKAREV, V. V.

"Low thrust space flight mechanics." Survey paper.

report submitted for 15th Intl Astronautical Cong, Warsaw, 7-12 Sep 64.

L 41783-65   BVO-2/EWT(d)/FBD/FSS-2/EWT(l)/EEC(a)/EWP(m)/FS(v)-3/EEC(j)/

SOURCE: Inzhenernyy zhurnal, v. 4, no. 2, 1964, 302-423

GRODZOVSKY, G. L.; IVANOV, Yu. N.; TOKAREV, V.V. (Moscow)

"Mechanics of space flight with low thrust".

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 Jan - 5 Feb 64.

ACCESSION NR: AP4022652   S/0207/64/000/001/0090/0094

AUTHORS: Tokarev, V. V. (Moscow); Tsvetkov, V. I. (Moscow)

TITLE: Optimal form of a gamma radiation shield

SOURCE: Zhurnal priklad. mekhan. i tekhn. fiz., no. 1, 1964, 90-94

TOPIC TAGS: gamma radiation, radiation shield, optimal shield

ABSTRACT: The problem of finding the optimal form of a γ-radiation shield (minimal weight) for a linear source of radiation was considered by L. R. Kimel' (Opre-deleniye optimal'noy formy* zashchitnogo bar'yera. Atomnaya energiya, 1959, t. 7, No. 3). However, the solution obtained is not applicable in all cases; for a large admissible radiation dose, the thickness at the edge of the source becomes negative. In this paper, a complete solution to the problem is obtained for linear, disk-shaped, and cylindrical radiation sources. In the case of a disk, the geometry is shown by Fig. 1 in the Enclosure. The dimensionless quantities σ, g, ζ, are introduced. These represent the radiation received at the point 0, the weight of the shield, and a measure of the thickness of the shield at φ, respectively. The optimal form of the shield is obtained by using the method of Pontryagin. It is given by the expression

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ACCESSION NR: AP4022652

$$\zeta(\varphi) = \ln\left(\frac{1 - \cos\varphi_0}{\sigma_0 \cos\varphi_0} + \cos\varphi\right) \text{ for } 0 < \varphi < \varphi_* \qquad (1)$$

The weight of the optimal shield is

$$g_0 = \sec\varphi_* - 1 + \ln\cos\varphi_* \text{ for } 1 - \cos\varphi_0 < \sigma_0 < -\ln\cos\varphi_0$$

$$g_0 = \frac{\ln\cos\varphi_0}{\cos\varphi_0} + \frac{1 - \cos\varphi_0}{\cos\varphi_0}\left(1 + \ln\frac{1 - \cos\varphi_0}{\sigma_0 \cos\varphi_0}\right) \text{ for } 0 < \sigma_0 < 1 - \cos\varphi_0 \qquad (2)$$

where φ_* is the solution of

$$\sigma_0 = 1 - \cos\varphi_* + \ln\cos\varphi_* - \ln\cos\varphi_0. \qquad (3)$$

The method, when applied to the cylindrical case, yields somewhat more complicated expressions for the optimal form and weight of the shield. Orig. art. has: 7 figures and 29 equations.

ASSOCIATION: none

SUBMITTED: 23Oct63   DATE ACQ: 08Apr64   ENCL: 01

SUB CODE: PH   NO REF SOV: 003   OTHER: 000

Card 2/3 2

... parameters ... state, which is universal

... no. 5,

Core 1/3

$(I^{\ldots}, \, z_{\, \, \, }, \, {}^{\ldots}, \, \varepsilon_{ig}^{\ldots} \, \ldots)$

By using this probabilistic formulation, the defined problem can be

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L 22210-65

ACCESSION NR: AP500214.

... for the extended system of differen-
... and with the

... the maximal ... and declare ... rig. art.

ACCESSION NR: AP4041565.   S/0293/64/002/003/0414/0432

AUTHOR: Ivanov, Yu. N.; Tokarev, V. V.; Shalayev, Yu. V.

TITLE: Optimum trajectories and parameters of space vehicles with limited-power engines

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 3, 1964, 414-432

TOPIC TAGS: optimum trajectory, interplanetary trajectory, optimum interplanetary trajectory, space vehicle weight, space vehicle weight parameter

ABSTRACT: A plane problem of the round-trip flight of a cosmic vehicle from the gravitational field of the earth to that of another planet is discussed. This problem of transportation of a maximum load (in variational formulation) consists of determining the optimum trajectories and optimum control of the acceleration vector due to thrust, and of the selection of the optimum weight parameters of vehicle components. The trajectory of such a flight consists of the following sections: 1) acceleration and take-off from an orbit around the earth in the terrestrial gravitational field; 2) flight

Card 1/2

ACCESSION NR: AP4041565

in the central field of the sun; 3) deceleration in the gravitational
field of the planet and entering some orbit around it; 4) acceleration
and take-off from that orbit; 5) return flight; and 6) deceleration
and entering some orbit around the earth. The results of the calcu-
lation of optimum trajectories of the flight to an external planet
(Mars) and internal planet (Venus) are given, as well as the data
on the optimum acceleration and deceleration sections of the trajec-
tories, and on the negligible effect of the gravitational fields of
planets during flight between their orbits. For the sake of simpli-
city it is assumed that the orbits of planets are circular and
coplanar. Orig. art. has: 17 figures, 5 tables, and 40 formulas.

ASSOCIATION: none

SUBMITTED: 21Aug63   ATD PRESS: 3055   ENCL: 00

SUB CODE: SV   NO REF SOV: 002   OTHER: 001

Card 2/2

ACCESSION NR: AP4026965   S/0258/64/004/001/0168/0196

AUTHORS: Grodzovskiy, G. L. (Moscow); Ivanov, Yu. N. (Moscow); Tokarev, V. V. (Moscow)

TITLE: Mechanics of low thrust cosmic flights. 3.

SOURCE: Inzhenerny*y zhurnal, v. 4, no. 1, 1964, 168-196

TOPIC TAGS: cosmic flight optimization, power-limited vehicle, exhaust velocity, thrust vector, maximum payload, flight trajectory

ABSTRACT: The third and last series in the analysis of cosmic flight optimization of power-limited vehicles has been presented. Part One dealt with the limits of the regulating characteristics of the vehicle system. The attainable variation range for flow rate q and exhaust velocity V is investigated as a function of maximum jet thrust power N_{max}. The optimum control of the thrust vector, V and N are discussed under the conditions

$$0 < N(t) < N_{max}(V) < N_0,$$

$$0 < V_{min} < V(t) < V_{max} < \infty.$$

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ACCESSION NR: AP4026965

An expression is derived relating the power source weight G_N to the flight trajectory characteristics. In Part Two the motion of a power-limited vehicle is discussed for the case of engine operation time less than the vehicle flight duration. The variational problem is considered under variable thrust power flow rate and thrust vector conditions with the optimum combination of power-limited and exhaust velocity-limited engines. It is shown that this combination yields an advantage in total payload if each type of engine has the same payload before combination. Part Four deals with reliability in engine performance for missions of long duration. The optimization criterion assumed here is the condition of a minimum in the sum of average necessary and reserve fuel weights plus the dead weight of the engine. An example is given where it is shown that in a round trip mission the departure leg takes place faster than the return leg of the trip, shifting the given engine-time break to the beginning of the trajectory. The optimization studies are extended to include weights in addition to the previously considered weights of working substance, power source, and payload. Finally, mid-course correction possibilities are studied, including corrections in velocity and position, and a general expression is derived for the optimal correction moment distribution. Orig. art. has: 145 equations, 11 figures, and 1 table.

Card 2/3

GRODZOVSKIY, G.I. (Moskva); IVANOV, Yu.N. (Moskva); TOKAREV, V.V. (Moskva).

Mechanics of a space flight with low thrust. Inzh. zhur. 4
no.2:392-423 '64   (MIRA 17:8)

TOGUREV, V.V. (Moskva); VATIIN, Yu.M. (Moskva)

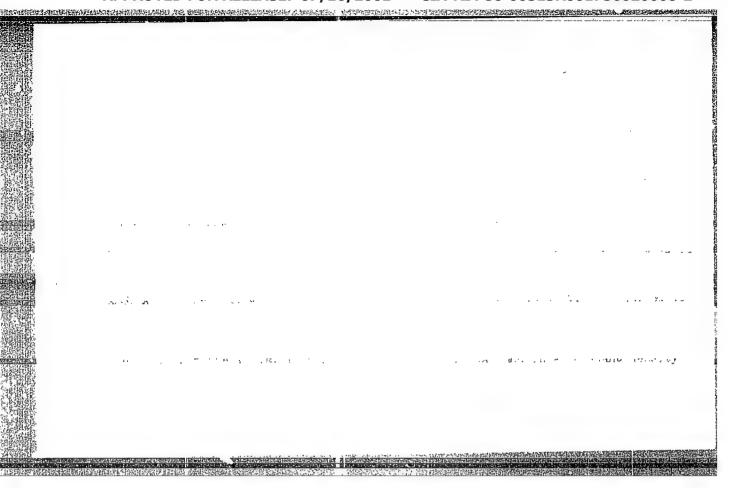Accumulator of the working substance in the problems of optimization of a motion with restricted power. Inzh. zhur. 5 no.3:531-536 '65. (MIRA 18:7)
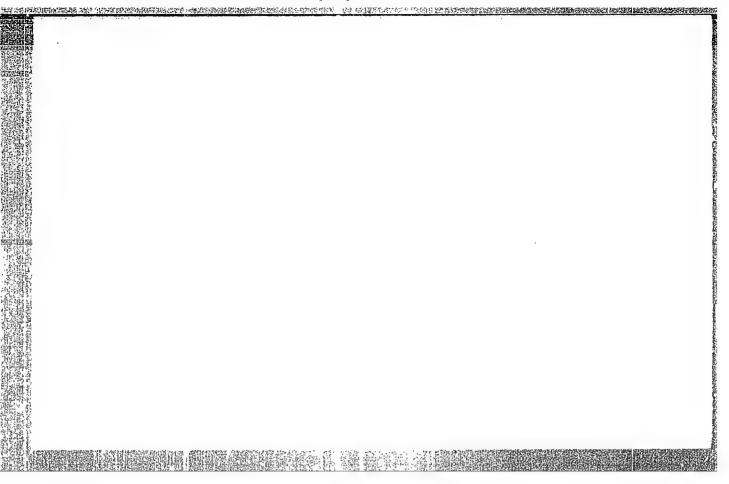
GRODZOVSKIY, G.I.; KIFORENKO, B.N.; TOKAREV, V.V.

Energy storage in problems of the optimization of motion with
limited power. Izv. AN SSSR. Mekh. no.3:40-48 My-Je '65.
(MIRA 18:7)

TITLE: Energy storage in power-limited flight optimization problems

L 22000-00   BWT(G), BWT(3)/BWT(w), BWT(d)   AT(e),   RJ, WW

ACC NR: AP6007575   SOURCE CODE: UR/0040/66/030/001/0014/0029

AUTHOR: Tokarev, V. V. (Moscow)

ORG: none

TITLE: Some questions of reliability in optimum control problems

SOURCE: Prikladnaya matematika i mekhanika, v. 30, no. 1, 1966, 14-29

TOPIC TAGS: optimum control, control system reliability, Mayer variational problem, power limited flight, velocity limited flight

ABSTRACT: The optimum control problem is analyzed with the reliability of the controlled system taken into account. The article consists of two parts. In the first part, a dynamic system described by the system of equations

$$x_i{}' = f_i(t, x_j, u_k, w_l) \qquad (i, j = 0, 1, \ldots, n;\ k = 1, \ldots, r;\ l = 1, \ldots, q) \qquad (1)$$

is taken, where x_i are phase coordinates, U_k are control functions, and W_l are constant control parameters. At t it is required to find a control program and control parameters such that a certain performance functional is optimized and the preassigned probability R of failure-free operation (the reliability) is ensured. The probability (reliability) that no failure will occur in the time interval $(0, T)$ is taken as equal

Card 1/2

L 22666-66
ACC NR: AP6007575

to

$$R = \exp\left(-\int_0^T \lambda\, dt\right),$$ (2)

where $\lambda = \lambda(t, x_j, u_k, w_l) \geqslant 0$ is the failure density function.   By applying the maximum principle of Pontryagin, equation (2) is written in the form of differential equations with corresponding boundary conditions which, with system (1), are the equations of the optimum control with a preassigned reliability.   The optimum control problem (Mayer's variational problem) defined in this manner is applied to the study of the problem of delivering the maximum useful payload considering the motion as that of a body of variable mass in the gravitational field.   Two cases are considered: delivery of the maximum useful payload by means of a thrust engine with limited jet power and with limited jet velocity.   The analytic solutions of certain model problems were obtained in the first case.   In the second part of the article, the problem of determining the optimal probability of failure-free operation of a jet engine is analyzed. The mathematical expectation of the maximum useful load or the minimum cost for performing of the maneuver is used as the optimality criterion.   It is indicated that the problem of determining the optimal probability of the maneuver defined in the article has meaning only when the maneuver must be performed repeatedly.   Some examples of solving such a problem for power-limited jet engines are presented.   It is shown how the optimal probability of performing certain maneuvers depends on the optimality criterion used.   Orig. art. has: 51 formulas and 13 figures.   [LK]

SUB CODE: 01/ SUBM DATE: 25May65/ ORIG REF: 004/ ATD PRESS: 4216

Card 2/2

L 05879-67   EWP(m)/EWT(l)   JW/JD

ACC NR: AT6022476   SOURCE CODE: UR/0000/65/000/000/0181/0197

75

AUTHOR: Grodzovskiy, G. L.; Ivanov, Yu. N.; Tokarev, V. V.

B+1

ORG: None

TITLE: Optimization problems in the mechanics of low-thrust space flight

SOURCE: Vsesoyuznyy. s"yezd po teoreticheskoy i prikladnoy mekhanike. 2d, Moscow, 1964.
Analitcheskaya mekhanika. Ustoychivost' dvizheniya. Nebesnaya ballistika (Analytical
mechanics. Stability of motion. Celestial ballistics); trudy s"yezda, no. 1, Moscow,
Izd-vo Nauka, 1965, 181-197

TOPIC TAGS: trajectory optimization, space flight, thrust optimization, solar sail

ABSTRACT: The authors consider the problem of optimization in the mechanics of space
flight with low thrust. Included in this problem are selection of the optimum ratios
between the weight components of the spacecraft and optimum control of the thrust
system as well as determination of the optimum trajectories of the flight in the aggre-
gate. A relationship is established between the weight characteristics and parameters
of the engine system and the possibilities for thrust control are discussed. Optimi-
zation of flight mechanics is considered in detail for systems using solar sails and

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L 05879-67

ACC NR: AT6022476

power-limited propulsion systems, e. g. electric reaction engines. It is shown that the problem of optimization for an ideal system resolves into two independent problems: 1. finding the optimum ratio between the weight of the power source and the weight of the working material and 2. finding the optimum trajectories and programs for the rocket acceleration vector. The literature covering the numerical solution of these problems is briefly reviewed. Orig. art. has: 13 figures, 34 formulas.

SUB CODE: 22/ SUBM DATE: 04Dec65/ORIG REF: 022/ OTH REF: 023

kh

Card 2/2

ACC NR: AR6029290   SOURCE CODE: UR/0313/66/000/006/0023/0023

AUTHOR: Grodzovskiy, G. L.; Ivanov, Yu. N.; Tokarev, V. V.

TITLE: Problems of optimization in the mechanics of cosmic flight with low thrust

SOURCE: Ref. zh. Issledovaniye kosmicheskogo prostranstva, Abs. 6.62.180

REF SOURCE: Tr. II Vses. s"yezda po teor. i prikl. mekhan., 1964. Obz. dokl. Vyp.
I. M., Nauka, 1965, 181-197

TOPIC TAGS: mars flight, space flight, trajectory optimization, optimum trajectory,
optimal control, thrust optimization, solar sail, jet engine, thrust to weight ratio,
thrust vector control

ABSTRACT: The optimization problem is reviewed as one of selecting the optimum
weight characteristics for the vehicle, the optimum engine control, and the optimum
trajectory. Considered as engines are the solar sail and the electrical jet engine
of limited power. Two optimization problems are suggested for solution with respect
to these latter: (1) calculation of optimum relationship of weights of power source
and working substance, and (2) calculation of the optimum trajectory and the program
for controlling the thrust vector. Examples of calculations for an earth-Mars flight
are cited. Bibliography of 54 titles. V. Ponomarev. [Translation of abstract]

SUB CODE: 22

Card 1/1

ACC NR: AP7002687   SOURCE CODE: UR/0424/66/000/006/0003/0010

AUTHOR: Tokarev, V. V. (Moscow); Fatkin, Yu. M. (Moscow)

ORG: none

TITLE: The game approach to the selection of the optimum parameters of a dynamic system

SOURCE: Inzhenernyy zhurnal. Mekhanika tverdogo tela, no. 6, 1966, 3-10

TOPIC TAGS: game theory, spacecraft payload, continuous function, guidance system

ABSTRACT: The problem is formulated in terms of the theory of antagonistic games. The given parameters are the range boundaries of possible maneuvers. It was attempted to find the parameters of a dynamic system such that it is optimum in a certain sense with respect to the indicated range of the maneuvers. The game takes place between the Designer and Nature. The state of the controlled object (or dynamic system) is defined by a system of conventional differential equations. A maneuver is defined by a set of boundary values of phase coordinates and time (T). The entirety of these values is denoted vectorially. The "quality" criterion for the performance of a maneuver is the finite value of a phase coordinate x_0,

$$x_0(T) = \text{extremum}$$

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ACC NR: AP7002687

In the course of the game, the Designer selects his moves so as to minimize his loss;
Nature plays so as to maximize the Designer's loss with every move of the Designer.
The game problem is applied to an ideal engine with limited power for the delivery of
the maximum payload into space. The payload (which is a functional), is plotted in
terms of a trade-off function. Several variants are considered, including: a) the
parameters of the maneuvers set by Nature are not known by the Designer, and b) the
parameters of the maneuvers attempted by Nature are in an interval that is known to
the Designer. The game value and the optimum strategies of the Designer and Nature
are evaluated. The relations between the optimum values of the parameters are illu-
strated in the following table

$\Delta\Phi$	0.8			0.6						0.2						
Φ_0	0.01	0.1	0.19	0.01	0.1	0.2	0.4	0.5	0.59	0.01	0.1	0.2	0.4	0.6	0.7	0.79
Φ_1	0.81	0.9	0.99	0.41	0.5	0.6	0.8	0.9	0.99	0.21	0.3	0.4	0.6	0.8	0.9	0.99
Φ^*	0.31	0.34	0.38	0.01	0.26	0.28	0.4	0.5	0.59	0.01	0.1	0.2	0.4	0.6	0.7	0.79
Φ^{**}	0.81	0.9	0.99	0.29	0.5	0.6	0.8	0.9	0.99	0.21	0.26	0.26	0.6	0.8	0.9	0.99
v^*	0.84	0.82	0.98	0.63	0.55	0.6	0.7	0.8	0.97	0.62	0.65	0.6	0.59	0.64	0.78	0.99
v^{**}	0.16	0.18	0.02	0.37	0.45	0.4	0.3	0.2	0.03	0.38	0.35	0.4	0.41	0.36	0.22	0.01

where ϕ^*, ϕ^{**} are the parameters of the maneuvers which are favorable for Nature;

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ACC NR: AP7002687

ΔG_π^A is the game value; G_x^A is the unique (or singular) optimum strategy of the Designer; $\Delta\phi = \phi_1 - \phi_0$. The loss is measured in units or multiples of payload. Orig. art. has: 32 formulas, 5 figures, 1 table.

SUB CODE: 12,13,22/   SUBM DATE: 02Apr66/   ORIG REF: 006

Card 3/3

RIVKIN, A.I.; TOKAREV, Ya.I.; KHITRUK, M.S.; PROKOPOVICH, A.Ye., redaktor; SHEMSHURINA, Ye.A., redaktor izdatel'stva; TIKHANOV, A.Ya., tekhnicheskiy redaktor

[Modernization of cylindrical grinding machines; manual of instructions] Modernizatsiia krugloshlifoval'nykh stankov; rukovodiashchie materialy. Pod red. A.E.Prokopovicha. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit.lit-ry, 1957. 102 p.
(MLRA 10:8)

1. Moscow. Eksperimental'nyy nauchno-issledovatel'skiy institut metallorezhushchikh stankov
(Grinding machines)

TOKAREV, Ya.I.

The 312M universal cyliner-and-cone grinding machine. Biul. tekh.-
ekon. inform. no.3:24-25 '58.   (MIRA 11:6)
                        (Grinding machines)

BOKUCHAVA, Giviy Vladimirovich; TOKAREV, Ya.I., inzh., retsenzent;
BEYZEL'MAN, R.D., red.Izd-va; SOROKINA, O.Ye., tekhn.red.

[Grinding metals in supplying cooling fluid through
grinding wheel pores] Shlifovanie metallov s podachei
okhlazhdaiushchoi zhidkosti skvoz' shlifoval'nyi krug.
Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry,
1959.   106 p.   (MIRA 13:1)
     (Grinding and polishing)   (Metalworking lubricants)

TOPIC TAGS: nuclear reactor, nuclear power station, ARBUZ

ABSTRACT: The requirements of atomic power stations are discussed and a description

Issledovatel skiy institut atomny*kh reaktorov (Scientific Research Institute of Atomic

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ACCESSION NR: AP4046911

ASSOCIATION: None

SUB CODE: NP

POLUSHKIN, K.K.; YEMEL'YANOV, I.Ya.; DELENS, P.A.; ZVONOV, N.V.; ALEKSENKO,
       Yu.I.; GROZDOV, I.I.; KUZNETSOV, S.P.; SIROTKIN, A.P.; TOKAREV,
       Yu.I.; LAVROVSKIY, K.P.; BRODSKIY, A.M.; BELOV, A.R.; BORISYUK,
       Ye.V.; GRYAZEV, V.D.; POPOV, D.N.; KORYAKIN, Yu.I.; FILIPPOV, A.G.;
       PETROCHUK, K.V.; KHOROSHAVIN, V.D.; SAVINOV, N.P.; MESHCHERYAKOV,
       M.N.; PUSHKAREV, V.P.; SUROYEGIN, V.A.; GAVRILOV, P.A.; PODLAZOV,
       L.N.; ROGOZHKIN, I.N.; TETYUKOV,V.D.

"Arbus" atomic power plant with organic heat transfer agent and
moderator. Atom. energ. 17 no.6:439 D '64   (MIRA 18:1)

L 01066-66   EPA(s)-2/EWT(m)/EWP(e)/EPF(c)/EWP(i)/EPF(n)-2/EWG(m)/EPA(w)-2/EWP(j)/T/
EWP(b)   WW/JG/DM/RM/WH

ABSTRACT: The authors report the results of an experimental investigation of hy-
draulic resistance of metal-ceramic disc filters for organic coolants, tested under
working conditions. This investigation is motivated by the fact that in organic-
cooled reactors (such as "Arbus" in the SSR or OMRE in the USA) the primary loop
coolant always contains some inorganic contaminats, in spite of a thorough cleaning.
The technology of preparing the filters is described. Stacks of filters made of
powders of different sizes were tested for filtering ability and for hydraulic re-
sistance by means of special experiments, using monoisopropyl diphenyl at 300C as
the test coolant. The set-up is briefly described. Plots of the pressure differ-
ential against the flow rate and of the local resistance to flow against the Rey-

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L 01066-66

ACCESSION NR: AP5014538

nolds number are presented, and an empirical formula for the latter is derived.
The test results show that the filters can be regenerated by means of a current
of coolant in the opposite direction, with the contaminants discarded into an
overflow tank. Orig. art. has: 5 figures, 1 formula, and 2 tables.

ASSOCIATION: none

SUBMITTED: 28Apr64   ENCL: 00   SUB CODE: NP

NR REF SOV: 005   OTHER: 001

Card 2/2

22C

L 24212-65   ENT(m)/EPF(c)/EPF(n)-2/EPR   Pr-4/Ps-4/Pu-4   DM

AUTHOR: Polushkin, K. K.; Yemel'yanov, I. Ya.; Delens, P. A.; Zvonov, N. V.; Aleksenko, Yu. I.; Grozdov, I. I.; Kuznetsov, S. P.; Sirotkin, A. P.; Tokarev, Yu. I.; Lavrovskiy, K. P.; Brodskiy, A. M.; Belov, A. R.; Borisyuk, Ye. V.; Gryazev, V. M.; Tetyukov, V. D.; Popov, D. N.; Koryakin, Yu. I.; Filippov, A. G.; Petrochuk, K. V.; Khoroshavin, V. D.; Savinov, N. P.; Meshcheryakov, M. N.; Pushkarev, V. P.; Suroyegin, V. A.; Gavrilov, P. A.; Podlazov, L. N.; Rogozhkin, I. N.

TITLE: Atomic electric power installation "Arbus" with organic coolant and moderator

TOPIC TAGS: small nuclear reactor, organic coolant, organic moderator, reactor economy, nuclear reactor

ABSTRACT: The paper is a summary of the SSSR # 307 report at the Third Inter-

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L 24212-65
ACCESSION NR: AP5001265

national Conference on Peaceful Uses of Atomic Energy, 1964. It describes an
installation of a reactor in which organic liquid serves as the coolant, and as the
moderator. The low-power reactors of about 5 Mw are expected to be economical
in the remote regions where the usual energy sources are not available. A regen-
eration system is described for the coolant which removes the products of radio-
lysis. Orig. art. has: 7 figures

ASSOCIATION: None

SUBMITTED: 00   ENCL: 00   SUB CODE: NP

NR REF SOV: 000   OTHER: 000

Card 2/2

TOKAREV, Yu.N.

Experience with combined experimental chemotherapy and stimu-
lation of phagocytosis in pneumococcal infection. Antibiotiki
4 no.1:96-100 Ja-F '59.   (MIRA 12:5)

1. Kafedra farmakologii, farmatsii i farmakognozii (zav. -
prof. N.V.Lezarev) Voyenno-meditsinskoy ordena Lenina akademii
imeni S.M.Kirova.
          (PNEUMOCOCCAL INFECTIONS, exper.
                eff. of various antibacterial drugs with drugs
                stimulating phagocytosis (Rus))
          (PHAGOCYTOSIS,
                phagocytosis stimulating drugs with anti-
                bacterial drugs in ther. of exper. pneumococcal
                infect. (Rus))
          (CHEMOTHERAPY,
                assoc. of antibacterial drugs with phagocytosis
                stimulating drugs in ther. of exper. pneumococ-
                cal infect. (Rus))

TOKAREV, Yu.N.

Effect of various pyrimidine derivatives on phagocytosis.
Farm. i toks. 22 no.2:168-172 Mr-Ap '59.   (MIRA 12:6)

1. Kafedra farmakologii, farmatsii i farmakognozii Voyenno-
meditsinskoy ordena Lenina akademii imeni S.M.Kirova (nach. -
zasluzhennyy deyatel' nauki prof. N.V.Lazarev).
              (PHAGOCYTOSIS, eff. of drugs on,
                  pyrimidine deriv. (Rus))
              (PYRIMIDINES, effects,
                  on phagocytosis (Rus))

TOKAREV, Yu.N., (kand.med.nauk; KOROL'KOV, F.N. (Kronshtadt)

Individual intolerance to osarsol. Vrach. delo no.8:133-134
Ag '61.
                    (ACETARSONE)   (MIRA 15:3)

ACCESSION NR: AT4037693   S/2865/64/003/000/0226/0234

AUTHOR: Kakurin, L. I.; Tokarev, Yu. N.

TITLE: The problem of experimentally investigating the work capacity of cosmonauts as applicable to space flight tasks

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy* kosmicheskoy biologii, v. 3, 1964, 226-234

TOPIC TAGS: Vostok, acoustics, manned space flight, simulation, cosmonaut, work capacity, crew structure

ABSTRACT: Ground experiments were conducted to determine the work capacity of cosmonauts under space-flight'conditions and to arrange optimum task structuring for space crews. A mockup of the Vostok-type ships was used to simulate space-flight conditions as closely as possible. The specific objectives of the studies were 1) to work out the various tasks making up the flight program, 2) to evaluate work-rest schedules,and 3) to study the effect of sealed environment and prolonged wearing of special garb on work capacity. The subjects were healthy males train-ed to the peak of physical fitness who had previously taken part in similar

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ACCESSION NR: AT4037693

experiments. Dressed in special clothing, each subject sat in a couch with his
back nearly horizontal. In this position he worked, took food, and rested. Once
a day he could move freely about the cabin for 40 min. The experiment lasted 3
days. A chemical air regeneration system was used. The behavior and condition of
the subjects were continuously observed and physiological indices were recorded
every 3 hr. Besides the physiological data, an important source of information
was the subject's own evaluation of his feelings. These reports, made by radio
and recorded in the logbook, were regarded as very important. Work capacity was
evaluated not only by exact conformity to the timetable of the experimental
program but also by the quality of the performance of set tasks of various kinds.
Supplementary evaluation of work capacity was based on the following tests:
1) Analysis of telegraph transmissions. Morse code transmissions by the subjects
were recorded and analyzed. This test was scored on the basis of the time required
for transmission (i.e., sending speed) and the number of errors. The best scores
were made on the second day, except for one subject who made his high score at the
end of the first day. Sending speed was best on the second day then gradually de-
creased, apparently owing to fatigue. Error analysis confirms this: related
symbols accounted for most of the errors at the beginning of the experiment, but
toward the end dissimilar signals were confused in most cases. It is significant

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ACCESSION NR: AT4037693

that most of the latter errors went unnoticed by the subjects. 2) Analysis of
psychological and physiological tests. The subjects were required to name geo-
metrical figures in order as they appeared on a special chart, over a microphone.
The time required to read off 150 figures and the errors made were used for scoring.
Another test was Krepolin's arithmetical calculation test. These tests confirm the
existence of a daily efficiency cycle. In the majority of cases, work was perform-
ed more effectively in the morning hours than in the evening hours. 3) Analysis
of radio reports and logbook entries. Six times a day the subjects reported medi-
cal control data, hygienic parameters of the cabin, instrument readings, and
details of the operation of the life support systems. These reports were recorded
on magnetic tape and then analyzed. The Morse code test is considered the most
adequate of these test methods because it requires the greatest degree of coordina-
tion of neuromuscular activity with the sense organs. These investigations showed
that the experimental program under evaluation simulates actual flight tasks as
closely as possible, is fully within the physical capabilities of man, and may in
principle be recommended for use during space flight. Since radio communication
between earth and spacecraft is of the greatest importance, other experiments were
conducted on auditory adaptation to background noise. Subjects were exposed to
continuous noise from ventilator fans for 25 to 30 days and their auditory thresh-

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ACCESSION NR: AT4037693

hold periodically checked for frequencies of 125, 250, 500, 1000, 3000, 4000, 6000, and 8000 cps. A sizable initial jump (1st and 2nd days) in the auditory threshold for all frequencies was followed by a relative increase in sensitivity the longer the subject remained in the new auditory environment (especially from the 15th to 25th days). This relative resensitization of the aural function is an interesting physiological phenomenon deserving further study. It may be a function of general adaptation of the organism to prolonged exposure to a new environment. The data obtained are important in that they may contribute to the solution of an extremely important problem -- the creation of an optimal acoustic background in spaceship cabins.

ASSOCIATION: none

SUBMITTED: 00   ENCL: 00   SUB CODE: PH, LS

NO REF SOV: 005   OTHER: 004

Card: 4/4

T. F... V. Yu. N.

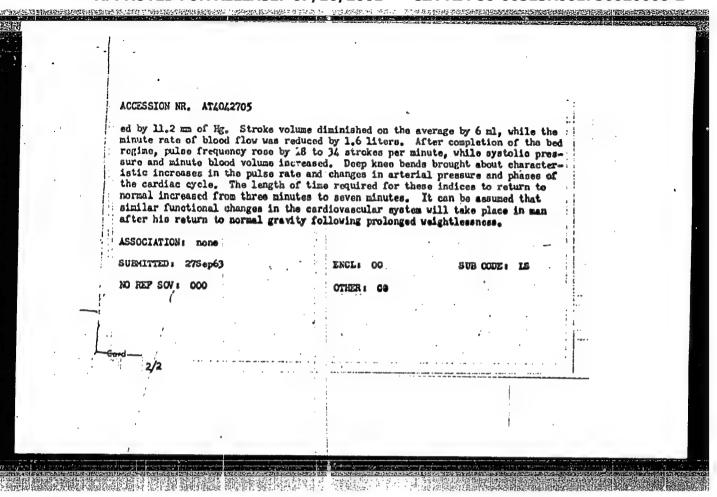ACCESSION NR: AT4042705   5/0000/63/000/000/0368/0371

AUTHOR: Myasnikov, A. L.; Akhrem-Akhremovich, R. M.; Kakurin, L. I.; Pushkar',
Yu. T.; Mukharlyamov, N. M.; Georgiyevskiy, V. S.; Tokarev, Yu. N.; Senkevich,
Yu. A.; Katkovskiy, B. S.; Kalinina, A. N.; Cherepakhin, M. A.; Chichkin, V. A.;
Filosofov, V. K.; Shamrov, P. G.

TITLE: Effect of prolonged hypokinesia on blood circulation in man

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963.
Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy
konferentsii. Moscow, 1963, 368-371

TOPIC TAGS: isolation, prolonged isolation, isolation chamber, isolation effect,
bioelectric activity

ABSTRACT: Four young men 22 to 24 were subjected to voluntary bedrest for a
period of 20 days. Tests on pulse, arterial pressure, rate of blood flow, venous
pressure, etc., were run before and after the completion of the experiment. These
tests were performed at rest and after functional exercises (30 knee bends at the
rate of one every 1.5 sec). During the period of bedrest, pulse frequency di-
minished on the average by 14 strokes per minute; the arterial pressure diminish-

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ACCESSION NR. AT4042705

ed by 11.2 mm of Hg. Stroke volume diminished on the average by 6 ml, while the
minute rate of blood flow was reduced by 1.6 liters. After completion of the bed
regime, pulse frequency rose by 18 to 34 strokes per minute, while systolic pres-
sure and minute blood volume increased. Deep knee bends brought about character-
istic increases in the pulse rate and changes in arterial pressure and phases of
the cardiac cycle. The length of time required for these indices to return to
normal increased from three minutes to seven minutes. It can be assumed that
similar functional changes in the cardiovascular system will take place in man
after his return to normal gravity following prolonged weightlessness.

ASSOCIATION: none

SUBMITTED: 27Sep63   ENCL: 00   SUB CODE: LS

NO REF SOV: 000   OTHER: 09

Card   2/2

BELYAYEVA, V.S.; TOKAREV, Yu.N., kand.med.nauk, nauchnyy rukovoditel'

Clinical aspects and treatment of onchocerciasis in Ghana.
Med. paraz.i paraz.bol. 34 no.4:423-427 Jl-Ag '65.
(MIRA 18:12)

1. Submitted October 24, 1964.

L 14266-66   EWT(1)/FS(v)-3   SCTB   DD/RD

ACC NR: AT6003842   SOURCE CODE: UR/2865/65/004/000/0075/0079

AUTHOR: Kustov, V. V.; Mikhaylov, V. I.; Pilipyuk, Z. I.; Tokarev, Yu. N.; *43*
Georgiyevskiy, V. S.; Katkovskiy, B. S.; Kalinina, A. N.

ORG: none

TITLE: Changes in several physiological and biochemical indices in man after
exposure to small concentrations of carbon monoxide

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii,
v. 4, 1965, 75-79

TOPIC TAGS: carbon monoxide, respiration, human physiology, test chamber, man,
biochemistry, blood, central nervous system

ABSTRACT: Experiments were performed on young adult men in order to test the
effects of carbon monoxide on certain biochemical indices. Each subject
participated in an eight-hr   background experiment (effect of hermeti-
zation) and an eight-hr experiment on the effects of carbon monoxide. A
carbon monoxide concentration corresponds to the concentration of carbon
monoxide exhaled by humans. The CO_2 concentration in the chamber did
not exceed 0. 6%, the air temperature was 18—22° C, the relative humid-

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ACC NR: AT6003842

ity was 50—60%. The catalyzing activity of the blood, the activity of cho-
linesterase in blood serum, and the carboxyhemoglobin content of blood were
measured in all subjects before and after the experiment. In addition
standard EKG, blood pressure, oxygen consumption, and oxygen utiliza-
tion were also measured. The subjects were also given mathematical
problems to solve.

After an exposure of six to seven hours, the subjects manifested
certain functional shifts in the cardiovascular system and external res-
piration, and also an increase in errors in test performance. The P, R,
and T points of the EKG showed a drop in voltage. The QRS complex
tended to expand (sometimes   accompanied by an increased heart rate).
The number of errors in all arithmetic tests showed a substantial increase.
After an eight-hr exposure to carbon monoxide, the carboxyhemo-
globin content of the blood increased from 0. 66 ± 0. 056% to 1.58 ±0. 43%.
This was accompanied by a statistically significant increase in the cho-
linesterase activity of the blood serum. The catalyzing activity of the
blood did not change.

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ACC NR: AT6003842

An analysis of the data obtained makes it possible to assume that the minute physiological shifts observed in man after exposure to carbon monoxide cannot be explained as simply the result of carbon monoxide hypoxemia, since the carboxyhemoglobin contant of the blood did not exceed 1. 58%. It is felt that these changes are due to the effect of carbon monoxide on tissues and that this tissue effect must be taken into account in setting standards of permissiable concentration of carbon monoxide in the air of hermetically sealed chambers. Orig. art. has: 3 tables. [ATD PRESS: 4091-F]

SUB CODE: 06 / SUBM DATE: none / ORIG REF: 006 / OTH REF: 004

Card 3/3

L 14272-66   EWT(1)/FS(v)-3   SCTB   DD/RD

ACC NR: AT6003837   SOURCE CODE: UR/2865/65/004/000/0027/0030

AUTHOR: Georgiyevskiy, V. S.; Kakurin, L. I.; Kalinina, A. N.; Katkovskiy, B. S.;
Kustov, V. V.; Mikhaylov, V. I.; Pilipyuk, Z. I.; Tokarev, Yu. N.

ORG: none

TITLE: Effects of eight-hour isolation and hypokinesia on several physiological
and biochemical indices in man

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy
biologii, v. 4, 1965, 27-30

TOPIC TAGS: isolation test, hypokinesia, test chamber, respiration, human
physiology, biochemistry, man, EKG, blood pressure, blood circulation,
physiologic parameter

ABSTRACT: A study was performed in order to determine the effects of short-term
isolation and hypokinesia on the basic physiological and biochemical indices
of man. Ten young men, 21—24 years of age, were kept for 8 hours in a
sitting position in a hermetically sealed chamber with forced ventilation
of atmospheric air. The oxygen content was 20—21%, and the CO_2 content
was 0.01—0.03%. The temperature varied between 20—22° C and the
relative humidy between 50—60%. The parameters measured included the

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ACC NR: AT6003837

standard EKG, pulse frequency, arterial blood pressure, stroke and minute volumes of blood circulation, peripheral resistance, and the cardiac index. In addition, the frequency, depth, and per minute volume of respiration were measured, along with oxygen consumption, the coefficient of oxygen utilization, the amount of oxygen consumed from 1 liter of air, the vital capacity of the lungs, and certain other indices.

After 8 hours of isolation and hypokinesia, the majority of the subjects showed a diminution in pulse frequency (16%), an insignificant increase in stroke volume (11%), a diminution in per minute volume, and an increase in peripheral circulatory resistance (23%). Except for a slight tendency to bradycardia, the EKG did not show any deviations. Although changes in the respiratory functions were varied, they did not exceed limits of normal physiological-variation, except for a tendency toward retardation of forced exhalation of air of about 0.5 sec. After physical exercise, oxygen debt in most of the subjects was cancelled somewhat sooner, while ventilation debt was cancelled more slowly. Energy expenditures required by physical exercise dropped after the experiment at the expense of a diminution in oxygen debt. The number of errors in psychological (intelligence) tests
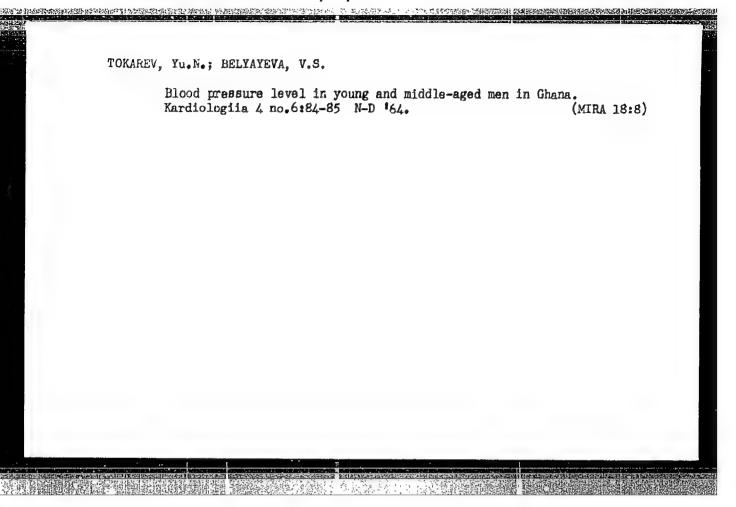
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ACC NR: AT6003837

tended to increase toward the end of the experiment, indicating a certain
degree of inertia in nervous processes. The amount of carboxyhemoglobin
in the blood diminished from 1.48 ± 0.48 to 0.51 ± 0.26 after the exper-
iment and, the catalyzing activity of the blood increased. Both of these
changes were statistically significant. The cholinesterase activity of the
blood serum diminished by 8.8%. No significant changes were noted in the
urea content of the blood. At the same time, the amount of ammonia and
urea in urine tended to diminish. In general, 8 hours of isolation and
hypokinesia did not lead to any substantial functional shift in the human
organism. Orig. art. has: 3 tables. [ATD PRESS: 4091-F]

SUB CODE: 06 / SUBM DATE: none / ORIG REF: 004 / OTH REF: 002

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TOKAREV, Yu.N.; BELYAYEVA, V.S.

Blood pressure level in young and middle-aged men in Ghana.
Kardiologiia 4 no.6:84-85   N-D '64.   (MIRA 18:8)

GEORGIYEVSKIY, V.S.; KAKURIN, L.I.; KALININA, A.N.; KATKOVSKIY, B.S.;
        KUSTOV, V.V.; MIKHAYLOV, V.I.; PILIPYUK, Z.I.; TOKAREV, Yu.N.

Effect of eight-hour isolation and hypokinesia on some physiol-
ogical and biochemical indices in man. Probl. kosm. biol.
4:27-30 '65.   (MIRA 18:9)

KUSTOV, V.V.; MIKHAYLOV, V.I.; PILIPYUK, Z.I.; TOKAREV, Yu.N.; GEORGIYEVSKIY, V.S.; KATKOVSKIY, B.S.; KALININA, A.N.

Change in some physiological and biochemical indices of man subjected to carbon monoxide in low concentrations. Probl. kosm. biol. 4:75-79 '65.   (MIRA 18:9)

AMOSOV, N.N.; DUBIN, A.S.; ZUBKOV, V.A.; STARTSEV, V.I.; TOKAREV,
     Yu.S.; SHKARATAN, O.I.; KURTYNIN, M.S., red.; ZHEREBKINA,
     D.I., red.; LEVONEVSKAYA, L.G., tekhn. red.

     [A generation of shock workers; a collection of documents
     and materials on socialist competition in Leningrad
     industrial plants in 1928-1961] Pokoleniia udarnikov;
     sbornik dokumentov i materialov o sotsialisticheskom sorev-
     novanii na predpriiatiiakh Leningrada v 1928-1961 gg. Le-
     ningrad, Lenizdat, 1963. 454 p.   (MIRA 16:9)

     1. Leningrad. (Province) Gosudarstvennyy arkhiv Oktyabr'skoy
     revolyutsii i sotsialisticheskogo stroitel'stva.
          (Leningrad—Socialist competititon)

ACCESSION NR: AP4031627

AUTHORS: Getmantsev, G. G.; Tokarev, Yu. V.

TITLE: Nonthermal galactic radio emission and the electronic component of cosmic rays in a nonstationary approximation

SOURCE: Geomagnetizm i aeronomiya, v. 4, no. 2, 1964, 243-246

TOPIC TAGS: radio astronomy, cosmic ray, cosmic ray electron component, relativistic cosmic electron, cosmic electron formation, cosmic electron energy spectrum, nonthermal galactic radio emission, nonthermal emission frequency spectrum

ABSTRACT: The steady-state model of relativistic cosmic electron formation is shown to be incompatible with recent radio-astronomical observations. A simple nonstationary model is proposed from which the electron energy spectrum is derived. It is assumed that the relativistic electrons are formed as a result of collisions between heavy cosmic particles and interstellar gas nuclei and, hence, have the same initial energy spectrum as the heavy particles producing them. It is further assumed that the heavy cosmic particles have a relict origin, i.e., they were formed during the youth of the galaxy. Only energy losses due to synchrotron

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ACCESSION NR: AP4031627

radiation are considered in the computation of the electron energy spectrum
(these losses predominate in the particle energy range of interest corresponding
to nonthermal radio emission of wavelengths)

$$\lambda \leqslant 10 \; \mathbf{M_.}$$

The effect on the form of the energy spectrum due to the limiting cases of the
parameter

$$a = T_{\pi}/T_{\epsilon}$$

is discussed, there T_{π} is the lifetime of the heavy cosmic particles forming the
secondary relativistic electrons with a lifetime T_{e}. For

$$\alpha \to \infty$$

it is found that for sufficiently small T_{e} the electron energy spectrum coincides
with that of the heavy particles. However, as T_{e} increases, the electron spectrum
becomes steeper due to synchrotron losses. In the other limiting case

$$\alpha \to 0,$$

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ACCESSION NR: AP4031627

for sufficiently small T_π the energy spectrum has a sharp discontinuity. As

$$T_n \to \infty$$

(the steady-state model of relativistic electron formation), the bend completely disappears. From the energy spectrum for the relativistic electrons the frequency spectrum of their synchrotron radio emission can be found, having a similar form. The existing experimental data are not sufficiently reliable to compute estimates of the various parameters in the expressions for the electron energy spectrum. However, a bend in the frequency spectrum is observed, indicating that the steady-state model can not be correct. Orig. art. has: 4 equations.

ASSOCIATION: Radiofizicheskiy institut pri Gor'kovskom gosudarstvennon universitete (Radiophysics Institute of Gorkiy State University)

SUBMITTED: 15Sep62   DATE ACQ: 30Apr64   ENCL: 00

SUB CODE: AA   NO REF SOV: 003   OTHER: 007

Card 3/3

GETMANTSEV, G.G.; TOKAREV, Yu.V.

Nonthermal galactic radio emission and the electron component of cosmic rays in nonsteady-state approximation. Geomag. i aer. 4 no.2:243-246 Mr-Ap '64.   (MIRA 17:4)

1. Radiofizicheskiy institut pri Gor'kovskom gosudarstvennom universitete.

TOKAREV, Zh.V.; DUBITSKIY, G.M.

Irregularity of feeder performance. Lit.proizv. no.2:27-28
F '62.   (MIRA 15:2)
              (Risers (Founding))

PORUCHIKOV, Yu. P.; TOKAREV, Zh.V.;SHATOV, A. Ya.

Selection of an efficient shape and size of risers for steel castings. Izv. vys. ucheb. zav.; chern. met. 7 no.6:144-148
'64.
(MIRA 17:7)

1. Ural'skiy politekhnicheskiy institut.